

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for compacting a surface of a wooden workpiece, the method comprising:

providing a wooden workpiece from a group selected from at least one of a solid wooden workpiece, a workpiece manufactured from materials similar to wood, bamboo, reed, other wood-based materials, plywood, chipboards, wood-containing paper, and paper enriched with resins

heating a surface of the wooden workpiece in at least partial areas – while preventing the entry of oxygen – by supplying energy to the surface, which energy supply produces a frictional relative motion on the wooden workpiece and hence a heating and a destruction of the cell structure thereof:

placing the wooden workpiece under pressure until a thermoplastic adhesive substance coming from the wooden workpiece is formed; and

compacting the surface and a volume area beneath the surface under application of pressure while being cooled.

2. (Currently Amended) A method for connecting two wooden workpieces contacting each other, the method comprising:

providing a first and second wooden workpiece, each having a contact surface;

heating both the contact surface of a first wooden workpiece and the contact surface of a second wooden workpiece in at least partial areas of the surfaces contacting each other – while preventing the entry of oxygen – by supplying energy to the contact surfaces, which energy supply produces a frictional relative motion between the wooden workpieces and hence a heating and a destruction of the cell structure of at least one wooden workpiece;

placing the first and second wooden workpieces under pressure until a thermoplastic adhesive substance is formed, whereby the two wooden workpieces are pressed against each other with their contact surfaces under application of pressure;

cooling the contact surfaces of the two wooden workpieces and volume areas beneath said surfaces cooled;

compacting a surface area of at least one of the wooden workpieces under pressure; and

welding the wooden workpieces to one another, with the thermoplastic adhesive substance penetrating under the contact surfaces of the wooden workpieces.

3. (Currently Amended) The method according to claim 1, further comprising a step of conditioning the wooden workpiece during the supply of energy, to at least one of a predetermined maximum moisture content, to a predetermined minimum temperature, and to a surface quality such as roughness.

4. (Currently Amended) The method according to claim 1, further comprising a step of conditioning the wooden workpiece prior to the energy supply, to at least one of a

predetermined maximum moisture content, to a predetermined minimum temperature, and to a surface quality such as roughness.

5. (Currently Amended) The method according to claim 1, wherein the friction is caused by an oscillating relative motion between the surface of the wooden workpiece and the surface of a counter workpiece, in particular in the form of a linearly oscillating relative motion that moves in a direction roughly parallel to the surface or in the form of an ultrasonic motion that moves in a direction at an arbitrary angle, preferably at a right angle to the surface of the wooden workpiece, by a relative motion oscillating vertically to the surface of the wooden workpiece.

6. (Currently Amended) The method according to claim 5, wherein the relative motion is produced with the aid of ultrasound.

7. (Currently Amended) The method according to claim 5, wherein a second wooden workpiece is used as the counter workpiece.

8. (Currently Amended) The method according to claim 5, further comprising a step of using a counter workpiece having a smooth surface with a small wetting angle which prevents adhesion.

9. (Currently Amended) The method according to claim 1, wherein the degree of the compaction is accomplished depending on properties of the wooden workpiece.

10. (Currently Amended) The method according to claim 9, wherein the degree of the compaction is accomplished depending on the density of the wooden workpiece.

11. (Currently Amended) The method according to claim 9, wherein the compaction is accomplished depending on a mechanical strength value of the wooden workpiece.

12. (Currently Amended) The method according to claim 1, wherein the method is first performed across a partial surface of a wooden workpiece and subsequently across further partial surfaces of the wooden workpiece.

13. (Currently Amended) The method according to claim 12, wherein the method is performed across the surface of a wooden workpiece in a continuously progressive manner.

14. (Currently Amended) The method according to claim 12, wherein the density of the wooden workpiece is measured continually during the method and at least one of the compaction and the formation of the thermoplastic adhesive substance is effected depending on the measured values.

15. (Currently Amended) The method according to claim 14, wherein the compaction is effected by a force which is roughly vertical to the longitudinal axis of the wood fibers of a wooden workpiece.

16. (Currently Amended) The method according to claim 15, wherein the compaction is performed at an angle deviating from 0° relative to the longitudinal direction of the wood fibers of a wooden workpiece, which deviation is smaller than 90° relative to the longitudinal direction of the wood fibers.

17. (Currently Amended) The method according to claim 16, wherein, in order to stabilize the dimension of the compaction, a vaporization of the compacted surface of the wooden workpiece is carried out after the surface compaction.

18. (Currently Amended) The method according to claim 1, wherein the thermoplastic adhesive substance is manufactured in an anaerobic atmosphere.

19. (Currently Amended) A device for compacting a surface of a workpiece, the device comprising:

a workpiece receiver for at least one wooden workpiece;

a first station comprising an energy-supply means which can be oriented toward a surface of the wooden workpiece;

a second station comprising a compaction means which can be oriented toward a surface of the wooden workpiece; and

a third station comprising a cooling means for the wooden workpiece.

20. (Currently Amended) The device according to claim 19, further comprising a conveyor by means of which a wooden workpiece can be transported with the workpiece receiver from one station to another.

21. (Currently Amended) The device according to claim 19, further comprising a conveyor by means of which individual stations can be transported to a wooden workpiece.

22. (Currently Amended) The device according to claim 19, wherein the compaction means is coupled to the cooling means.

23. (Currently Amended) The device according to claim 19, wherein at least one of the energy-supply means, the compaction means, and the cooling means can be brought into direct contact at the surface of the wooden workpiece.

24. (Currently Amended) The device according to claim 19, wherein the workpiece receiver is provided with a conditioning means for the wooden workpiece designed as at least one of a drying means and a heating means.

25. (Currently Amended) The device according to claim 19, wherein the energy-supply means is designed as a means acting upon a counter workpiece, which means produces a frictional relative motion between the counter workpiece and the wooden workpiece.

26. (Currently Amended) The device according to claim 25, wherein the frictional relative motion is oriented parallel to the surface of a wooden workpiece, which surface is to be treated.

27. (Currently Amended) The device according to claim 25, wherein the frictional relative motion is oriented roughly vertically to the surface of a wooden workpiece, which surface is to be treated.

28. (Currently Amended) The device according to claim 25, wherein the counter workpiece has a smooth surface by means of which it can be brought into direct contact with the surface of the wooden workpiece.

29. (Currently Amended) The device according to claim 25, wherein the counter workpiece is also designed as a wooden workpiece and both wooden workpieces can be brought into direct contact with their contact surfaces to be connected.

30. (Currently Amended) The device according to claim 19, further comprising a further station including a vaporization means for vaporizing a compacted wooden workpiece.

31. (Currently Amended) The device according to claim 19, further comprising a testing device for nondestructive testing of the treated wooden workpiece.

32. (Currently Amended) The device according to claim 19, wherein the device is provided with an enclosure attached to a gas-supply line to a supply means for anaerobic gas, at least in the region of the energy-supply means and in the region of the compaction means.

33. (Currently Amended) The device according to claim 20, wherein the conveyor comprises two conveyor belt facilities whose conveyor belts are arranged opposite each other in such a way that at least one wooden workpiece is insertable by the opposing strands of the conveyor belts, which are actuatable in one and the same direction and at one and the same speed, which wooden workpiece can be conveyed, via the opposing strands, to the energy-supply means and further to the compaction means and cooling means as well as to an optionally provided testing device and to an optionally provided vaporization means.

34. (Currently Amended) The device according to claim 33, wherein one of the two conveyor belt facilities comprises two conveyor belts arranged one after the other in the machine direction and actuatable in the same direction, between which a supply means for at least one of a further wooden workpiece and an energy-supply means is provided.

35. (New) The method according to claim 2, further comprising a step of conditioning the wooden workpieces during the supply of energy, to at least one of a predetermined maximum moisture content, to a predetermined minimum temperature, and to a surface quality such as roughness.

36. (New) The method according to claim 2, further comprising a step of conditioning the wooden workpieces prior to the energy supply, to at least one of a predetermined maximum moisture content, to a predetermined minimum temperature, and to a surface quality such as roughness.

37. (New) The method according to claim 2, wherein the friction is caused by an oscillating relative motion between the surface of the wooden workpiece and the surface of a counter workpiece, in particular in the form of a linearly oscillating relative motion that moves in

a direction roughly parallel to the surface or in the form of an ultrasonic motion that moves in a direction at an arbitrary angle, preferably at a right angle to the surface of the wooden workpiece, by a relative motion oscillating vertically to the surface of the wooden workpiece.

38. (New) The method according to claim 37, wherein the relative motion is produced with the aid of ultrasound.

39. (New) The method according to claim 37, wherein a second wooden workpiece is used as the counter workpiece.

40. (New) The method according to claim 37, further comprising a step of using a counter workpiece having a smooth surface with a small wetting angle which prevents adhesion.

41. (New) The method according to claim 2, wherein the degree of the compaction is accomplished depending on properties of the wooden workpieces.

42. (New) The method according to claim 41, wherein the degree of the compaction is accomplished depending on the density of the wooden workpieces.

43. (New) The method according to claim 41, wherein the compaction is accomplished depending on a mechanical strength value of the wooden workpieces.

44. (New) The method according to claim 2, wherein the method is first performed across a partial surface of a wooden workpiece and subsequently across further partial surfaces of the wooden workpiece.

45. (New) The method according to claim 44, wherein the method is performed across the surface of a wooden workpiece in a continuously progressive manner.

46. (New) The method according to claim 44, wherein the density of the wooden workpiece is measured continually during the method and at least one of the compaction and the formation of the thermoplastic adhesive substance is effected depending on the measured values.

47. (New) The method according to claim 46, wherein the compaction is effected by a force which is roughly vertical to the longitudinal axis of the wood fibers of a wooden workpiece.

48. (New) The method according to claim 47, wherein the compaction is performed at an angle deviating from 0° relative to the longitudinal direction of the wood fibers of a wooden workpiece, which deviation is smaller than 90° relative to the longitudinal direction of the wood fibers.

49. (New) The method according to claim 48, wherein, in order to stabilize the dimension of the compaction, a vaporization of the welded joint of the wooden workpieces is carried out after the welding.

50. (New) The method according to claim 2, wherein the thermoplastic adhesive substance is manufactured in an anaerobic atmosphere.

51. (New) The method according to claim 8, wherein the smooth surface with a small wetting angle is at least one of a metallic and mirrored surface.

52. (New) The method according to claim 40, wherein the smooth surface with a small wetting angle is at least one of a metallic and mirrored surface.

53. (New) The method according to claim 14, wherein the compaction is effected by a force which is in a radial direction of a tree trunk.

54. (New) The method according to claim 46, wherein the compaction is effected by a force which is in a radial direction of a tree trunk.